NORTHERN TERRITORY OF SOUTH AUSTRALIA.

REPORT

ON THE

MACDONNELL RANGES MINING DISTRICT

(PRESENT AND FUTURE PROSPECTS),

BY

WARDEN AND INSPECTOR OF MINES, SOUTH AUSTRALIA,
W. H. MATTHEWS.

MINISTER CONTROLLING THE NORTHERN TERRITORY,
HON. L. O'LOUGHLIN.

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SOUTH AUSTRALIA.

REPORT ON THE MACDONNELL RANGES MINING DISTRICT.

REPORT of INSPECTOR of MINES on the MACDONNELL RANGES MINING DISTRICT.

Mines Department, Adelaide, August 28th, 1905.

Sir—In accordance with instructions I left Adelaide on the 5th June, 1905, and Oodnadatta on the 9th, arriving at Arltunga on the 26th, and herewith beg to submit the following general reports on the Arltunga and Winnecke's goldfields; also the mica field, Hart's Range. Detailed reports of the various properties, with assay results, will follow as quickly as time will permit.

I am, &c.,

W. H. MATTHEWS, Warden and Inspector of Mines.

The Hon. L. O'Loughlin, Minister Controlling the Northern Territory.

ARLTUNGA GOLDFIELDS.

The Arltunga goldfields are situated by road 425 miles from Oodnadatta, the terminus of the Transcontinental Railway, and 1,113 miles from Adelaide.

The White Range, in which at present are the principal claims in the Arltunga district, is a very prominent landmark, standing about 600ft. above the plain level, composed chiefly of quartzite and quartzose. The general strike of the range is about north and south in places, crossed by deep ravines, and for a considerable width numerous quartz veins, ranging from small seams to large massive blocks of stone, invariably underlying south at an angle of 45°. There is no indication of a true or well-defined lode. The small veins and large irregular formations are enclosed and intermixed with quartzite, in places faulted and broken to a considerable extent.

The gold occurrence is of a very peculiar nature, principally occurring in vughs, crevices, and what is locally known as cellular quartz, which at times is exceedingly rich, the balance of solid stone being of low grade, at present not of sufficient value to pay the cost of cartage and battery treatment and leave a profit to the holders.

Consequently the mode of work is exceptional, and a considerable amount of care is taken in separating the lower grade portions of stone from the richer material.

The vein matter after being raised is placed on dressing floors, in most instances broken similar to road metal, screened through a ¼in. mesh screen, the coarser portions being hand picked, and the fines with all that contain vughs or cellular quartz is saved for treatment; the balance is discarded and placed in the waste dumps. The proportion of stone raised and saved for treatment is 1 ton in 4; consequently by taking the average crushings from each claim for the past six months and adding the gold contents of 3 tons of the discarded material to the 1 ton treated, then divided by four, will give the correct average value of the stone raised in bulk for that period.

From the various workings in the different properties throughout the fields I took a large number of samples (the results of which will be forwarded with the detailed reports), but owing to the peculiar nature under which the gold occurs I found it impossible to obtain anything like a reliable average. Should the sample be taken in bulk across the vughs or contain an undue proportion of fines or cellular quartz the yield would be of an exceptional value. Again, should the sample not contain the portions mentioned, the result would be almost barren.

This difficulty, to such an extent, does not occur in sampling the waste material, as the stone is broken to various sizes, and the form of screening and hand-picking thoroughly mixes all classes of material, and a much more reliable average sample can be obtained; consequently I consider the gold contents of the waste matter being added to the average crushings as described gives by far the most reliable estimate of its value in bulk.

In my examination of the White Range properties I have formed the opinion that to successfully continue operations it must be done in a more systematic and extensive scale. The various claims, instead of being owned by separate owners and worked in the most crude manner, should be amalgamated, creating one large company with sufficient capital to procure the necessary reduction plant, such as a large crushing mill and

and cyanide works, rock-drilling plant, overhead tramways, and other up-to-date appliances for the economical dispatch of large ore bodies. But previous to capital being expended in this direction it would be advisable to ascertain by shaft-sinking or diamond drill boring if the vein matter maintained its usual width and average value at deeper levels, say from 200ft. to 400ft. vertical depth. It would be also absolutely necessary that a good supply of water sufficient to meet all requirements should be first assured, either by wells or surface reservoirs, there being several good sites for the latter within a reasonable distance.

I find the general average of the stone raised in bulk from the nine principal claims on the White Range for the past half year is 10dwts. of gold per ton. This, with a moderate amount of sorting, could be increased to probably 11dwts. or 12dwts. per ton by picking out the large barren portions that contain little or no cellular stone. This yield would not be of a sensational character, but with a good supply of water, economical management, and with the appliances indicated should prove remunerative and a fair mining investment.

The present mode of working is chiefly confined to the surface and to a vertical depth of from 15ft. to 30ft., following the seams, vughs, and cellular quartz that contains the most valuable material. Below this depth the vein matter and enclosing rock are exceptionally hard, and the question of its size and value remains to be determined.

The mines that have been worked in the other parts of the field are not of such hard dense nature, the enclosing rock being chiefly schist and granitic formations, but in most instances the veins are smaller and the stone raised requires the same careful selection to bring the yield up to a payable standard. This is partly necessary owing to the high cost of transit from the claims to the reduction works and the gold contents not being equally distributed through the vein matter.

Gold Yield.—The total quantity of ore treated from this field ended the 30th June, 1905, is 6,562 tons, yielding 7,949ozs. of gold, valued at £29,093, or an average yield of 1oz. 4dwts. of gold per ton.

Alluvial.—At the time the first gold was discovered several alluvial gullies were opened out in the vicinity of the lode outcrops, yielding good returns, and still continue to give employment to a few prospectors or alluvial workers.

Water Supply.—The following is the approximate water supply from the local wells :—

Cyanide Works Well	3,000 to 5,000	gallons per day
Kangaroo Well, near Police Camp	3,000	" "
Paddy's Hole, two miles from Cyanide Works	5,000 to 7,000	" "
White Range No. 1 Well	150	" "
Wheal Mundy Well, eight miles from Cyanide Works	300	" "
Wipe-out Well	70	" "

Men Employed.—On the field there are 40 men employed, exclusive of those working on the Government Cyanide Works, 26 on the White Range properties, six on outside claims, and eight in the alluvial.

WINNECKE'S GOLDFIELDS.

The Winnecke's goldfields are located 30 miles from Arltunga, and extend for a distance of four miles in an easterly and twelve miles westerly direction from the Reward Claim. The gold-bearing strata is chiefly schist and granitic rock, and the principal claims are situated at the foot and about a quarter of a mile from a long high range of hills, in many respects closely resembling the White Range.

Within this area large numbers of claims have been taken up ; on many of them little or no work has been done. In others fair legitimate prospecting work has been accomplished, in some instances under great difficulties, which usually attend the development of new fields in remote localities.

General features of the country are broken hills and small valleys. The former are traversed by short, irregular quartz outcrops, usually striking about east and west, underlying north, and dipping east. Many of these outcrops have in the past stood considerably above the enclosing rock, but with time have become broken and shed their vein croppings on each side, making the ore bodies appear of much greater width than actually exist. Doubtless when thoroughly explored some of these ore bodies will be found to penetrate the country rock to a considerable depth and prove permanent, but in a large number of instances will prove to be surface outcrops of not a permanent nature.

Throughout the field large numbers of shafts, both vertical and underlie, have been sunk, the former ranging from 20ft. to 130ft. in depth, disclosing, principally at the shallow levels, large massive quartz formations, that can only be thoroughly tested by battery crushings. In one respect the character of the ore matter is similar to the Arltunga field, the gold contents being largest in the vughs, crevices, and cellular quartz, requiring care in selecting the stone for treatment ; 45 samples were taken from various ore bodies and separate workings, extending over a large area, and gave an average result of 10dwts. 6grs. per ton. This must not be taken as an indication of the value of any particular mine that will be dealt with in the detailed reports.

Crushings.—From returns furnished I find the total quantity of stone crushed up to June 30th, 1905, to be 600 tons 8cwts., yielding 870ozs. 8dwts. of gold, valued £3,452 17s., or an average of 1oz. 9dwts. per ton.

Machinery.—On the field there has been erected by the New Coorong Crushing Company a 10-stamp mill, which, if necessary, can be increased to 15 ; but, unfortunately, at the time of my visit the water supply was of such a limited nature that only a very small quantity of stone could be treated. From the company's well drives were then being extended to, if possible, supplement the supply, which it is to be hoped will be successful, as the field cannot be thoroughly prospected and developed without crushing facilities.

Alluvial.—The two most important alluvial workings are situated in deep ravines crossing the quartzite hills, mentioned as resembling the White Range. These, with other small gullies in the vicinity of the principal claims, have yielded large quantities of gold, but are now almost exhausted, and give employment to a few individual miners only.

Water.—At various points throughout the district there are natural rockholes, but not of sufficient capacity to supply water during the summer months. To supplement these the Government have sunk what is known as Winnecke's Well, which yields 1,200galls. per day. This, I think, by driving would be considerably improved.

The Coorong Company's well supplies about 1,100galls. per day, which I have heard has been increased, but to what extent I am not aware.

Population.—The total number of inhabitants engaged in various pursuits is 50.

MICA FIELDS.

The mica fields are situated in the Hart's Range, about 40 miles from Arltunga, but considerably more by road, which winds through deep gorges and around the sides of high, precipitous ranges, following the creek beds. The most important claims are located on the northern watershed of Hart's Range, east and west of Mount Palmer, the mica-bearing dykes, principally composed of felspar and quartz, showing in the sides of the ranges for many miles in length. These have been explored chiefly by open cuttings and shallow surface workings, proving the dykes to be of great width. The mica is distributed throughout the matrix in detached blocks, and not confined to any particular point. The blocks when extracted are split, sorted and cut to different size sheets, ranging from 2in. up to 10in. or 12in. square, and larger if they can be obtained.

In places portions of the sheets are slightly discolored, but by far the largest quantity is clear, and can be easily split into sheets as required. At the time of my visit only one mine was being worked, and within a short period 1 ton of cut mica was raised and sent to England as a sample.

Apparently the great drawback to the field is the want of local buyers to purchase the product. If a strong company was established with sufficient capital to open up and work the most important mines and purchase the product at a fair profit from the individual miner I believe it would prove a profitable investment to the company, and give employment to a large number of men. Men employed, four.

FUTURE PROSPECTS AND DEVELOPMENTS.

During the time of my inspection of the Arltunga and Winnecke's goldfields and the surrounding localities I saw no discoveries of a sensational character, but from its auriferous nature and general indications it must be regarded as a country possessing great possibilities. Each district contains a large extent of gold-bearing country and numerous lode outcroppings with sufficient favorable indications to justify their being explored with every reasonable chance of success. I am further of the opinion that many abandoned claims that in the past have yielded good returns, if they were fairly worked and developed, would still continue to give satisfactory results. In each district the want of water has proved a serious matter to mining operations, but no special effort has been made to surmount that difficulty beyond sinking wells, which up to the present have failed to supply the quantity required.

As instructed, I selected several sites for diamond drill boring, chiefly on the White Range, but until the workings are further explored by sinking shafts to a reasonable depth, to ascertain for certain the underlie of the ore bodies, which at present is very irregular, I question the advisability of forwarding machinery there for that purpose. There will also be many expensive difficulties to overcome that could not be seen previous to my inspection and when the boring was first contemplated; owing to the difficult work that will have to be accomplished considerably more than the usual plant will be required, and the cost of transit to the fields will be exceedingly heavy. When there it would have to be taken up the side of a steep rugged range, from 200ft. to 300ft. high, and for each hole foundations for the machinery would have to be taken out of the sold quartzite rock, and all water required, which under the most favorable conditions would be 1,200galls. per day, will have to be carted in tanks eight miles. These and other expensive difficulties can with time be overcome, but I am of opinion that at present it would be more to the advantage of the fields, and less expense to the Government, to at first liberally subsidise companies or private parties at so much per foot for shaft-sinking, and for the present utilise the diamond drill at the Port Darwin end of the Northern Territory, where I have resided for two years and know something of its mineral prospects.

I am, &c.,

W. H. MATTHEWS, Warden and Inspector of Mines.

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